What is claimed is:

1. A device for processing multi-color data, comprising:

a gamma converting part to perform gamma conversion with respect to RGB (red, green, blue) gray-scale data to obtain gamma-converted RGB data;

a white extracting part to extract a white color component from the gamma-converted RGB data provided from the gamma converting part;

a data determining part to receive the gamma-converted RGB data from the gamma converting part and the white color component from the white extracting part and generating four-color RGBW (red, green, blue, white) data; and

a reverse-gamma converting part to perform reverse-gamma conversion with respect to the four-color RGBW data provided from the data determining part to generate reverse-gamma converted RGBW data to be displayed.

2. The device of claim 1, wherein the gamma converting part performs the gamma conversion with respect to each color data of the RGB gray-scale data to obtain each color data of the gamma-converted RGB data.

3. The device of claim 2, wherein the gamma converting part multiplies a gray-scale number of each color data of the RGB gray-scale data by a predetermined factor that is defined by $(1/G_{max})^{\gamma}$ (here, "G_{max}" denotes a maximum gray-scale level of the RGB gray-scale data).

4. The device of claim 1, wherein the white extracting part generates minimum gray-scale data of the respective gamma-converted RGB data as the white color component.

5. The device of claim 1, wherein the white extracting part includes:

a first comparison unit to determine which color data of the gamma-converted RGB data has a minimum value; and

a second comparison unit to compare the minimum value determined by the first comparison unit with a predetermined value.

6. The device of claim 5, wherein the white extracting part generates the minimum value of the gamma-converted RGB data as the white color component if the minimum value is smaller than the predetermined value, and generates the predetermined value as the white color component if the minimum value is equal to or larger than the predetermined value.

7. The device of claim 6, wherein the predetermined value is defined by aG_{max}^{γ}, where "G_{max}" denotes a maximum gray-scale level of the RGB gray-scale data, and "a" is a ratio of each color data of the gamma-converted RGB data to a gray-scale number of a corresponding color data of the RGB gray-scale data.

8. The device of claim 1, wherein the data determining part subtracts the white color component from each color data of the gamma-converted RGB data to generate corresponding color data of the four-color RGBW data.

9. The device of claim 8, wherein the data determining part determines white color data of the four-color RGBW data to be the same as the white color component extracted by the white extracting part.

10. A device for processing multi-color data, comprising:

a gamma converting part to perform gamma conversion with respect to RGB (red, green, blue) gray-scale data to obtain gamma-converted RGB data;

a remapping part to multiply the gamma-converted RGB data by a scaling factor and remapping the multiplication results to generate remapped RGB data;

a white extracting part to extract a white color component from the remapped RGB data provided from the remapping part;

a data determining part to receive the remapped RGB data from the remapping part and the white color component from the white extracting part and generating four-color RGBW (red, green, blue, white) data; and

a reverse-gamma converting part to perform reverse-gamma conversion with respect to the four-color RGBW data provided from the data determining part to generate reverse-gamma converted RGBW data to be displayed.

11. The device of claim 10, wherein the gamma converting part performs the gamma conversion with respect to each color data of the RGB gray-scale data to obtain each color data of the gamma-converted RGB data.

12. The device of claim 11, wherein the gamma converting part multiplies a gray-scale number of each color data of the RGB gray-scale data by a predetermined factor that is defined by $(1/G_{max})^{\gamma}$ (here, "G_{max}" denotes a maximum gray-scale level of the RGB gray-scale data).

13. The device of claim 10, wherein the remapping part multiplies each color data of the gamma-converted RGB data by the scaling factor that is in a range from about 1 to about 2.

14. The device of claim 10, wherein the white extracting part generates minimum gray-scale data of the respective remapped RGB data as the white color component.

15. The device of claim 10, wherein the white extracting part includes:

a first comparison unit to determine which color data of the remapped RGB data has a minimum value; and

a second comparison unit to compare the minimum value determined by the first comparison unit with a predetermined value,

wherein the white extracting part generates the minimum value of the remapped RGB data as the white color component if the minimum value is smaller than the predetermined value, and generates the predetermined value as the white color component if the minimum value is equal to or larger than the predetermined value.

16. The device of claim 15, wherein the predetermined value is defined by aG_{max}^{γ}, where "G_{max}" denotes a maximum gray-scale level of the RGB gray-scale data, and "a" is a ratio of each color data of the gamma-converted RGB data to a gray-scale number of a corresponding color data of the RGB gray-scale data.

17. The device of claim 10, wherein the data determining part subtracts the white color component from each color data of the remapped RGB data to generate corresponding color data of the four-color RGBW data.

18. The device of claim 17, wherein the data determining part determines white color data of the four-color RGBW data to be the same as the white color component extracted by the white extracting part.

19. An organic electro-luminescent display (OELD) device for processing multi-color gray-scale data, comprising:

a four-color converting part to convert primary RGB gray-scale data into compensated RGBW gray-scale data by adding white gray-scale data to the primary RGB gray-scale data;

a data driving part to process the compensated RGBW gray-scale data provided from the four-color converting part to generate four-color signals in an analog type;

a scan driving part to generat scan signals in sequence; and

an OELD panel to emit light with a color in response to the four-color signals from the data driving part and the scan signals from the scan driving part.

20. The OELD device of claim 19, wherein the four-color converting part includes:

a gamma converting part to perform gamma conversion with respect to the primary RGB gray-scale data to obtain gamma-converted RGB data;

a white extracting part to extract a white color component from the gamma-converted RGB data provided from the gamma converting part;

a data determining part to receive the gamma-converted RGB data from the gamma converting part and the white color component from the white extracting part and generating four-color RGBW data by subtracting the white color component from the gamma-converted RGB data and adding the white gray-scale data to the gamma-converted RGB data; and

a reverse-gamma converting part to perform reverse-gamma conversion with respect to the four-color RGBW data provided from the data determining part to generate reverse-gamma converted RGBW data to be displayed.

21. The OELD device of claim 20, wherein the white extracting part includes:

a first comparison unit to determine which color data of the gamma-converted RGB data has a minimum value; and

a second comparison unit to compare the minimum value determined by the first comparison unit with a predetermined value,

wherein the white extracting part generates the minimum value of the gamma-converted RGB data as the white color component if the minimum value is smaller than the predetermined value, and generates the predetermined value as the white

color component if the minimum value is equal to or larger than the predetermined value.

22. The OELD device of claim 19, wherein the four-color converting part includes:

a gamma converting part to perform gamma conversion with respect to the primary RGB gray-scale data to obtain gamma-converted RGB data;

a remapping part to multiply the gamma-converted RGB data by a scaling factor and remapping the multiplication results to generate remapped RGB data;

a white extracting part to extract a white color component from the remapped RGB data provided from the remapping part;

a data determining part to receive the remapped RGB data from the remapping part and the white color component from the white extracting part and generating four-color RGBW data by subtracting the white color component from the remapped RGB data and adding the white gray-scale data to the remapped RGB data; and

a reverse-gamma converting part to perform reverse-gamma conversion with respect to the four-color RGBW data provided from the data determining part to generate reverse-gamma converted RGBW data to be displayed.

23. The OELD device of claim 22, wherein the white extracting part includes:

a first comparison unit to determine which color data of the remapped RGB data has a minimum value; and

a second comparison unit to compare the minimum value determined by the first comparison unit with a predetermined value,

wherein the white extracting part generates the minimum value of the remapped RGB data as the white color component if the minimum value is smaller than the predetermined value, and generates the predetermined value as the white color component if the minimum value is equal to or larger than the predetermined value.

24. The OELD device of claim 19, wherein the OELD panel includes a plurality of pixels each including:

a switching element having a conduction path to transfer corresponding one of the four-color signals from the data driving part in response to corresponding one of the scan signals from the scan driving part;

a driving element having a conduction path to transfer a voltage signal provided from a power supply line in response to the corresponding one of the four-color signals provided from the switching element; and

a organic electro-luminescent element to generate light in response to the voltage signal provided from the driving element.

25. The OELD device of claim 19, wherein the OELD panel includes a plurality of pixels each including a red sub-pixel, a green sub-pixel, a blue sub-pixel and a white sub-pixel, wherein the red, green, blue and white sub-pixels each have a stripe shape and are arranged in parallel to each other.

26. The OELD device of claim 19, wherein the OELD panel includes a plurality of pixels each including a red sub-pixel, a green sub-pixel, a blue sub-pixel and a white sub-pixel, wherein the red, green, blue and white sub-pixels are arranged in a 2×2 lattice shape.

27. The OELD device of claim 19, wherein the OELD panel includes a plurality of pixels each including two red sub-pixel, two green sub-pixel, a blue sub-pixel and a white sub-pixel, wherein the red, green, blue and white sub-pixels are arranged in a 2×3 lattice shape.

28. The OELD device of claim 19, wherein the OELD panel includes:

a first insulating layer formed on a substrate;

a current control transistor formed on the first insulating layer, the current control transistor providing a controlled current;

a second insulating layer formed on the current control transistor, the second insulating layer having contact holes in which source and drain electrodes of the current control transistor are formed;

a third insulating layer formed on the second insulating layer and the source and drain electrodes of the current control transistor;

a pixel electrode formed on the third insulating layer, a part of the pixel electrode being extended to be in contact with the drain electrode of the current control transistor through a contact hole formed in the third insulating layer;

partition walls formed on the third insulating layer and the pixel electrode, adjacent ones of the partition walls defining a luminescent region of the OELD panel;

an organic electro-luminescent layer formed on partition walls and the pixel electrode, for emitting red, green, blue and white color light; and

an electrode layer formed on the organic electro-luminescent layer to serve as a cathode of the OELD device.

29. The OELD device of claim 28, wherein the adjacent partition walls are formed to define corresponding one of red, green, blue and white pixel regions.

30. The OELD device of claim 29, wherein the organic electro-luminescent layer includes red, green, blue and white electro-luminescent layers formed on the red, green, blue and white pixel regions, respectively, defined by the partition walls.

31. The OELD device of claim 28, wherein the electrode layer is a metal layer so that light is reflected by the metal layer and emitted through the substrate.

32. The OELD device of claim 28, wherein the electrode layer is transparent so that light passes through the electrode layer.

33. The OELD device of claim 19, wherein the OELD panel includes:

a first insulating layer formed on a substrate;

a current control transistor formed on the first insulating layer, the current control transistor providing a controlled current;

a second insulating layer formed on the current control transistor, the second insulating layer having contact holes in which source and drain electrodes of the current control transistor are formed;

a color pixel layer formed on the second insulating layer and the source and drain electrodes, the color pixel layer including red, green, blue and white color filters;

a planarizing layer formed on the color pixel layer;

a pixel electrode formed on the planarizing layer, a part of the pixel electrode being extended to be in contact with the drain electrode of the current control transistor through contact holes formed in the planarizing layer and the color pixel layer;

partition walls formed on the planarizing layer and the pixel electrode, adjacent ones of the partition walls defining a luminescent region of the OELD panel;

an organic electro-luminescent layer formed on partition walls and the pixel electrode; and

a metal electrode layer formed on the organic electro-luminescent layer to serve as a cathode of the OELD device.

34. The OELD device of claim 33, wherein the red, green, blue and white color filters of the color pixel layer are each formed between the current control transistor and the pixel electrode in a corresponding one of the red, green, blue and white pixel regions.

35. The OELD device of claim 19, wherein the OELD panel includes:

a first insulating layer formed on a substrate;

a current control transistor formed on the first insulating layer, the current control transistor providing a controlled current;

a second insulating layer formed on the current control transistor, the second insulating layer having contact holes in which source and drain electrodes of the current control transistor are formed;

a third insulating layer formed on the second insulating layer and the source and drain electrodes of the current control transistor;

a pixel electrode formed on the third insulating layer, a part of the pixel electrode being extended to be in contact with the drain electrode of the current control transistor through a contact hole formed in the third insulating layer;

partition walls formed on the third insulating layer and the pixel electrode, adjacent ones of the partition walls defining a luminescent region of the OELD panel;

an organic electro-luminescent layer formed on partition walls and the pixel electrode;

a transparent electrode layer formed on the organic electro-luminescent layer to serve as a cathode of the OELD device; and

a color pixel layer formed on the transparent electrode layer, the color pixel layer including red, green, blue and white color filters.

36. A method for processing multi-color data, comprising:

performing a gamma conversion with respect to primary RGB gray-scale data to generate gamma-converted RGB data;

extracting a white color component from the gamma-converted RGB data;

determining four-color RGBW data using the white color component and the gamma-converted RGB data; and

performing a reverse-gamma conversion with respect to the four-color RGBW data to generate compensated four-color RGBW data.

37. The method of claim 36, wherein the performing a gamma conversion includes multiplying a gray-scale number of each color data of the primary RGB gray-scale data by a predetermined factor defined by $(1/G_{max})^{\gamma}$ (here, "G_{max}" denotes a maximum gray-scale level of the RGB gray-scale data).

38. The method of claim 36, wherein the extracting a white color component includes determining minimum gray-scale data of the respective gamma-converted RGB data as the white color component.

39. The method of claim 36, wherein the extracting a white color component includes:

comparing the respective color data of the gamma-converted RGB data to determine which color data of the gamma-converted RGB data has a minimum value;

comparing the minimum value with a predetermined value;

generating the minimum value as the white color component if the minimum value is smaller than the predetermined value; and

generating the predetermined value as the white color component if the minimum value is equal to or larger than the predetermined value.

40. The method of claim 36, wherein the determining four-color RGBW data includes subtracting the white color component from each color data of the gamma-converted RGB data to generate corresponding color data of the four-color RGBW data.

41. A method for processing multi-color data, comprising:

performing a gamma conversion with respect to primary RGB gray-scale data to generate gamma-converted RGB data;

multiplying the gamma-converted RGB data with a scaling factor and remapping the multiplication results to generate remapped RGB data;

extracting a white color component from the remapped RGB data;

determining four-color RGBW data using the white color component and the remapped RGB data; and

performing a reverse-gamma conversion with respect to the four-color RGBW data to generate compensated four-color RGBW data.

42. The method of claim 41, wherein the multiplying includes multiplying each color data of the gamma-converted RGB data by the scaling factor that is in a range from about 1 to about 2.

43. The method of claim 41, wherein the extracting a white color component includes determining minimum gray-scale data of the respective remapped RGB data as the white color component.

44. The method of claim 41, wherein the extracting a white color component includes:

comparing the respective color data of the remapped RGB data to determine which color data of the remapped RGB data has a minimum value;

comparing the minimum value with a predetermined value;

generating the minimum value as the white color component if the minimum value is smaller than the predetermined value; and

generating the predetermined value as the white color component if the minimum value is equal to or larger than the predetermined value.